Installation Guide

1. Purpose

The purpose of this document is to provide information on how to integrate the Wireless Power Transmitter (Model: 81909001) and Receiver (Model: 81909002) with

FCC ID: 2AOR81909002

into a final application.

Incorrect integration or use may infringe compliance rules meaning recertification may be required.

2. Module Description

The Wireless Power modules (Tx= power transmitter, Rx = power receiver) are designed to provide a high efficiency power transmission of up to 60W to an USB Type-C device. This power transmission is using a pair of tightly coupled power coils. An additional pair of inductive coupled coils is used to transfer control information from the power receiver back to the transmitter to provide a safe operation at the optimum working frequency.

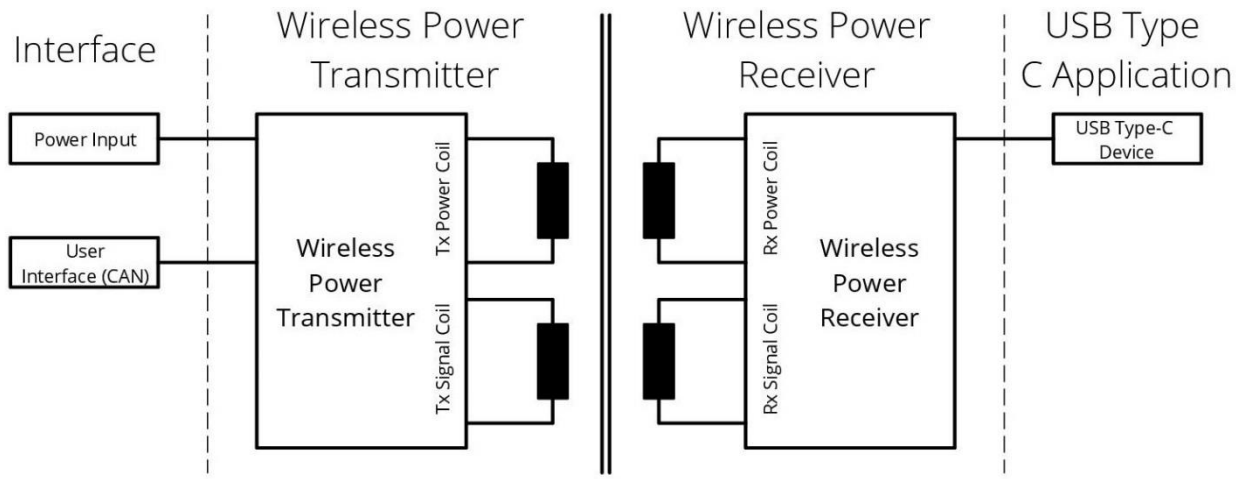
The power transmission module input voltage is 24V DC.

To maximize the system efficiency, the power transmission between Wireless Transmitter and Receiver is realized using resonant circuits. These resonant circuits additionally provide the ability to vary the transmitted power by changing the switching frequency. By increasing the switching frequency, the available power on the receiver side de-creases.

For an accurate output voltage regulation, a control loop is necessary. The output conditions like output current, voltage and power are measured on the receiver side and sent to the power transmitter. If corrections are necessary, the transmitter will change the switching frequency to the desired value.

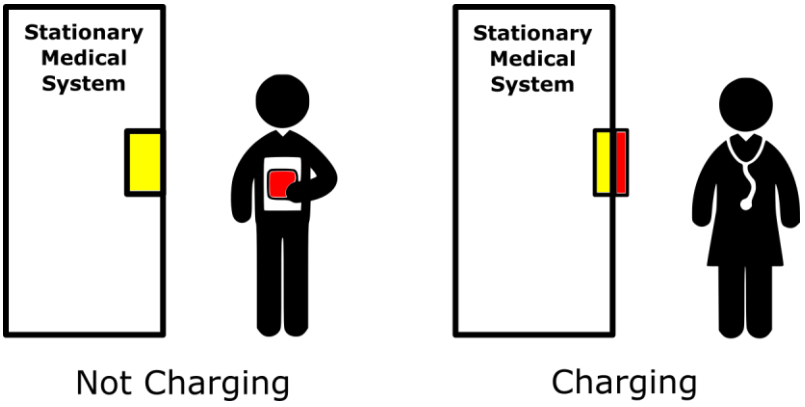
An appropriate control loop needs a fast signal transmission with little delay. This transmission is accomplished using a second pair of coupled coils. Like the power transmission coils, the signal coils form a near field coupling system thus the intended use of radio waves isn't necessary.

The following picture shows a block diagram of the complete system including Transmitter and Receiver.



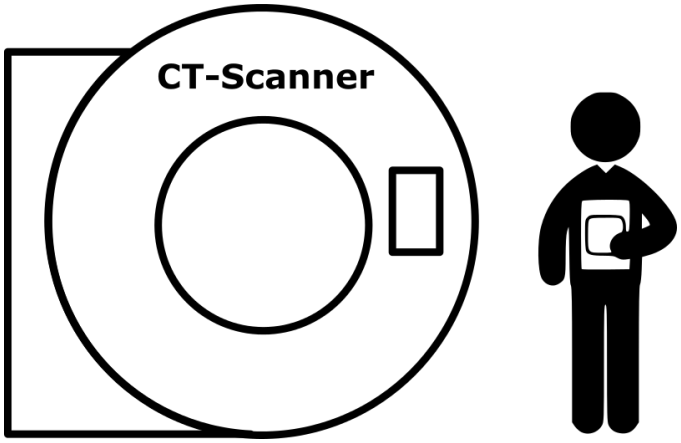
3. Application Examples

The system is designed to be used as a Wireless Charger for USB Type-C powered devices in medical environments (e.g. tablets). The Wireless Power Transmitter must be mounted on and powered by a base station. The Wireless Power Receiver can be connected with the USB Type-C device either using an USB type C compliant cable. The USB type-C device together with the Wireless Power Receiver can be used in mobile applications, the base station including the Wireless Power Transmitter is stationary and not intended for mobile usage. In order to start the charging process, the Power Receiver must be placed close to the Power Transmitter. Charging will only take place during non-mobile stationary usage. The power transmitter is stationary and the power receiver will be installed inside a non-stationary device. The power receiver and the device which will be charged are to be mounted in the same enclosure, so it's not possible for hum

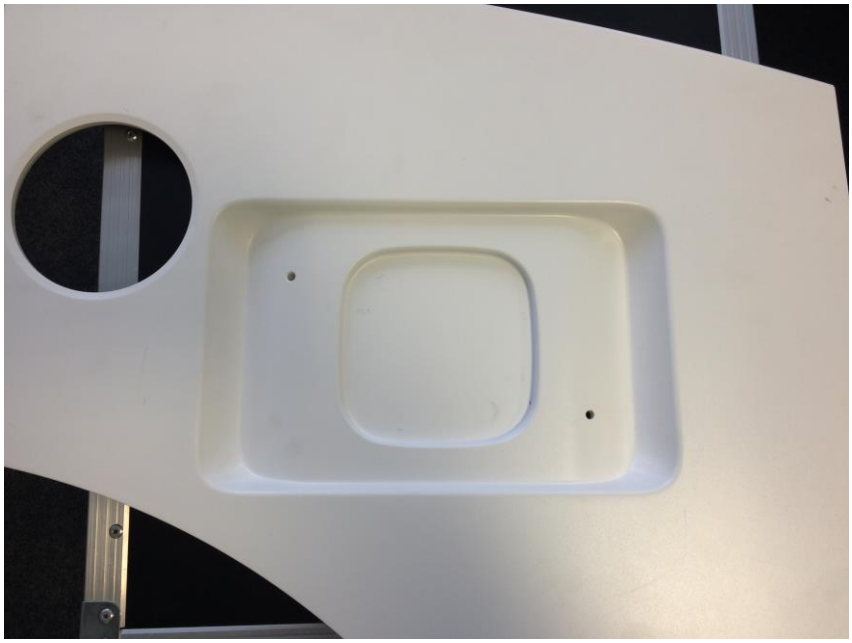


The picture shows the use cases "Not Charging" and "Charging". The Power Transmitter is depicted yellow, the Power Receiver red.

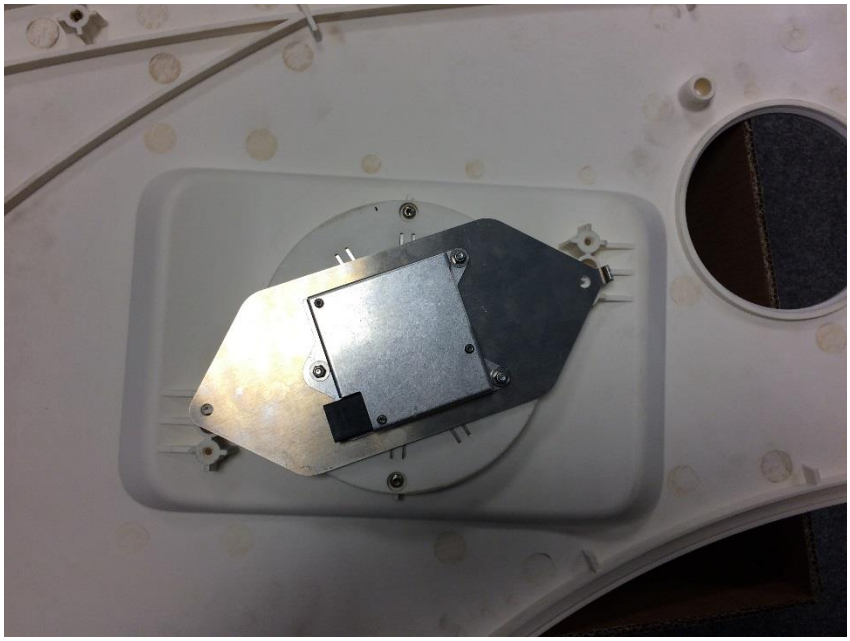
The following pictures shows an example application where the Wireless Power Transmitter is wall mounted on a computer-tomography scan unit and the Receiver is connected to a tablet which is used for supervision. In this situation the tablet isn't charging.



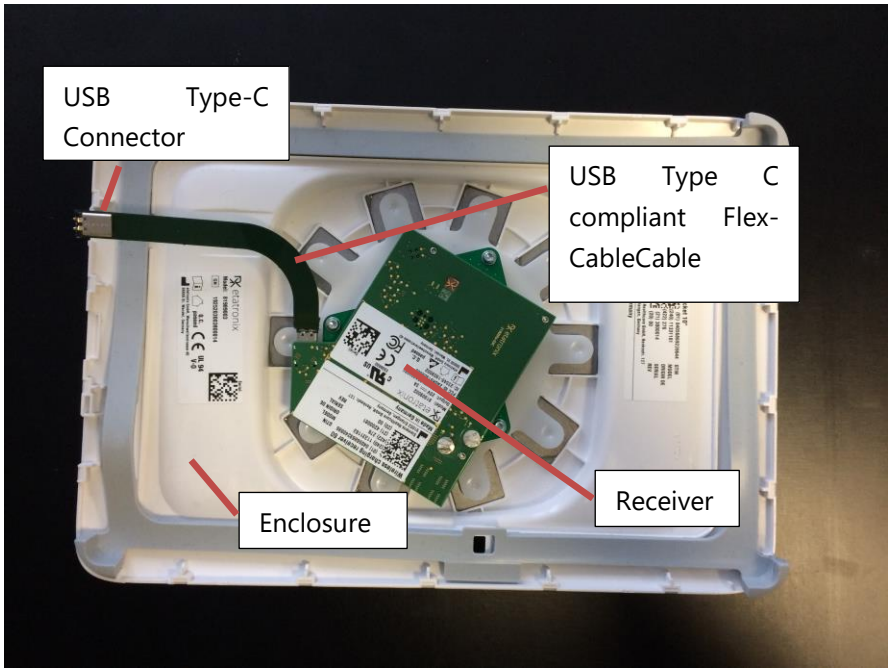
The following pictures shows part of the front of a medical stationary device. The Transmitter is mounted behind the front and not accessible on back and side:



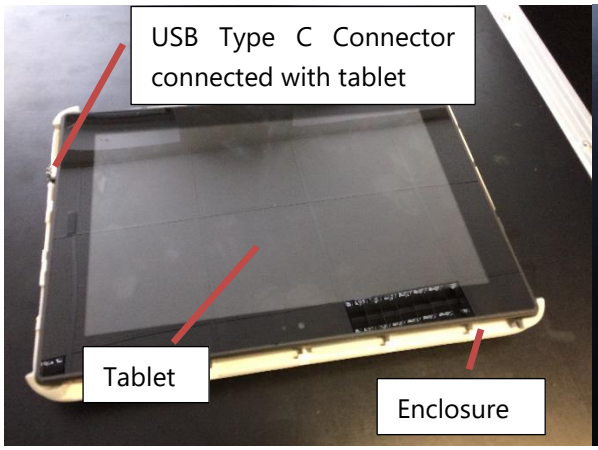
The following pictures shows the backside of the front of the stationary medical device where the Transmitter is mounted:

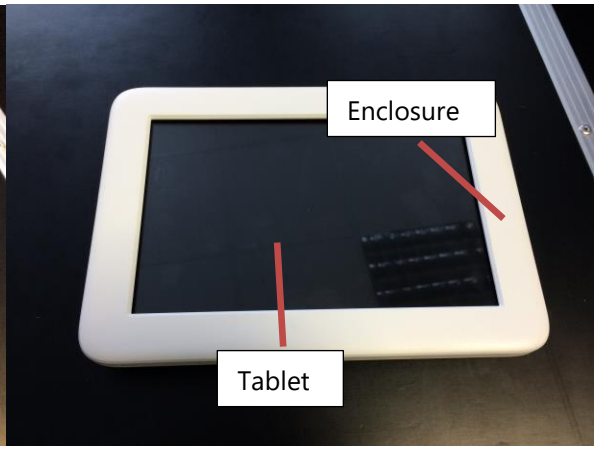


The following pictures shows the enclosure for both Wireless Receiver and tablet with Receiver mounted and tablet not mounted.



The following pictures shows the enclosure for both Wireless Receiver and tablet with Receiver and tablet mounted. The tablet is connected with the Receiver using an USB-cable (see picture above and section "Integration into products".



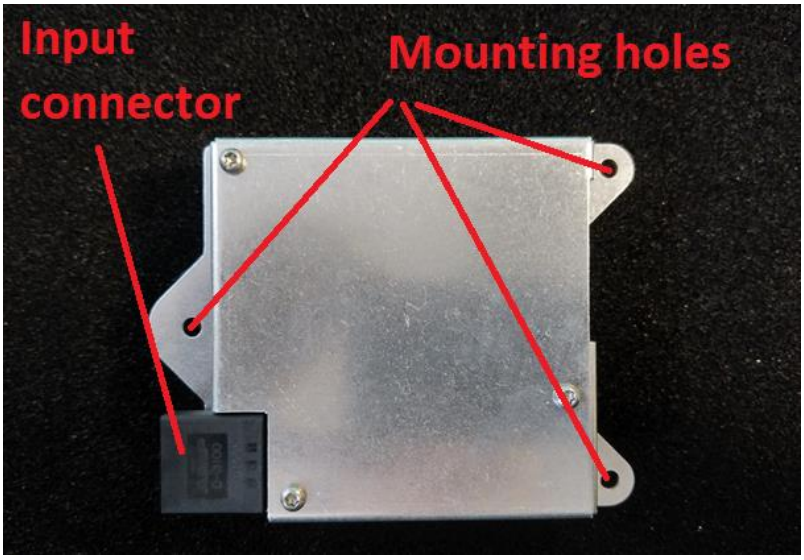


The following pictures shows the enclosure with tablet and Wireless Receiver put on top of the stationary medical device. This is the typical setup for the charging tablet:

4. Integration into Products

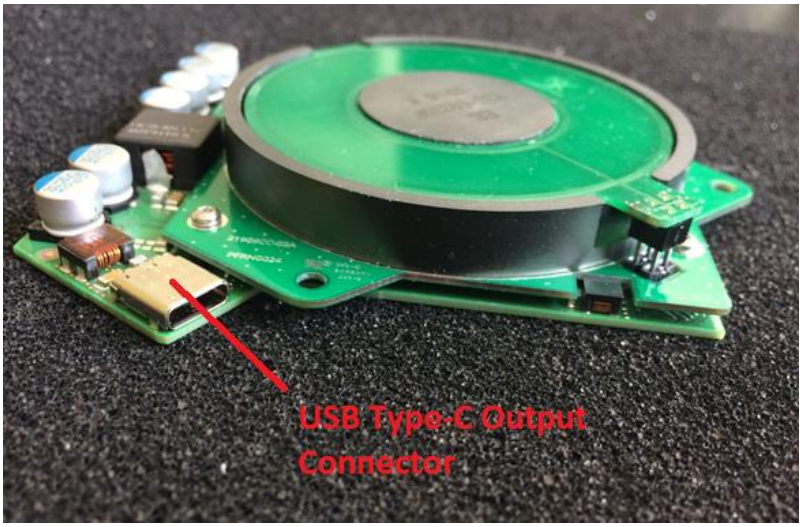
Transmitter

The input connector of the Wireless Power Transmitter is a TE Connectivity 1-178293-3. The Wireless Power Transmitter shall be mounted using the mounting holes provided by the manufacturer. M4 screws and hex nuts are recommended.



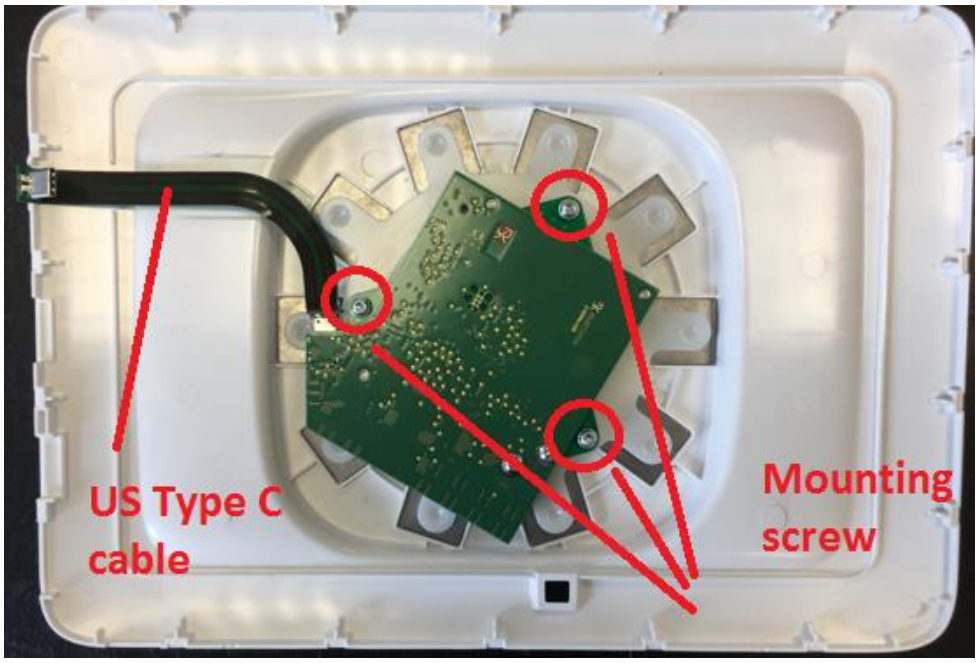
Receiver

The Wireless Power Receiver supplies a USB Type-C compliant 60W power supply to the host application. The following picture shows the USB type C output connector:



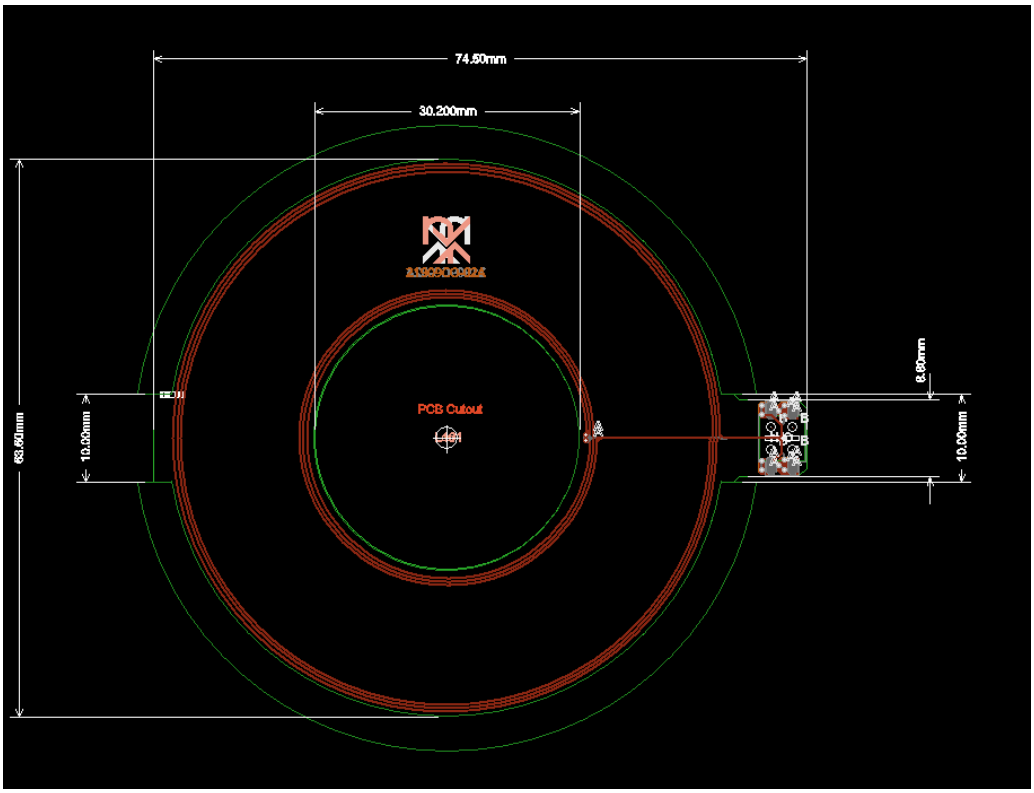
The Wireless Power Receiver shall be mounted using the mounting holes provided by the manufacturer. M3 screws are suitable, e.g. Screwerk STP 3803000803 or comparable. The cable to supply the load shall be USB Type-C compliant.

The following picture shows the system mounted in a final example application without the tablet.



5. Antenna design

The following picture shows the antenna design. The antenna is carried out on a 1mm PCB using traces of 200u width, the distance between the windings is 200u.



As shown in various EMC tests, no intended radiation is used to transmit data. All information is transmitted using the principle of near field coupled coils utilizing a carrier frequency of 2MHz. The coil area used is 440 mm².

6. Regulatory Information

FCC

This device complies with Part 15 of FCC Rules, Operation is Subject to following two conditions:

1) This device may not cause harmful interference, and

2) This device must accept any interference received including

Caution: Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.

This device and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter except in accordance with FCC's multi-transmitter procedures.

IMPORTANT NOTE:

FCC Radiation Exposure Statement; Co-location of this module with other transmitter that operate simultaneously are required to be evaluated using the FCC multi-transmitter procedures.

This module complies with the FCC portable exposure limits. This module has been tested in a specific host product and can be installed with a separation distance of 0mm in that host product.

ISED Canada

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures.

Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

IMPORTANT NOTE:

IC Radiation Exposure Statement:

RF Exposure: This module can be used in mobile applications with a separation distance of at least 20cm from all persons in accordance with RSS-102, Issue 5 (mobile application).

This device complies with the safety requirements for RF exposure in accordance with RSS-102 Issue 5 for portable use conditions (distance <20cm).

The RF exposure (Nerve Stimulation) compliance distance is 10cm

Exposition RF: Ce module peut être utilisé dans des applications mobiles avec une distance de séparation d'au moins 20 cm par rapport à toutes les personnes, conformément à la norme RSS-102, édition 5 (application mobile).

Le présent appareil est conforme aux limites d'exposition aux RF conformément au norme CNR-102 émission 5 pour conditions d'utilisation portable.

La distance de conformité d'exposition à la RF (stimulation nerveuse) est de 10 cm

Taiwan

Warning statement:

Article 12

Without permission, any company, firm or user shall not alter the frequency, increase the power, or change the characteristics and functions of the original design of the certified lower power frequency electric machinery.

Article 14

The application of low power frequency electric machineries shall not affect the navigation safety nor interfere a legal communication, if an interference is found, the service will be suspended until improvement is made and the interference no longer exists.

7. Integration Information for the OEM

It is the responsibility of the OEM / Host product manufacturer to ensure continued compliance to FCC and ISED Canada certification requirements once the module is integrated in to the Host product. Please refer to FCC KDB 996369 D04 for additional information.

The module is subject to the following FCC rule parts: 15.205, 15.207, 15.209 and 15.215

AC conducted emissions at the host's AC power input need to be verified with Wireless Power Transfer (WPT) PT / communications active to ensure continued compliance with 15.207 and 15.107

8. Host Product

User Guide Text/FCC Compliance

This device complies with Part 15 of FCC Rules, Operation is Subject to following two conditions:

1) This device may not cause harmful interference, and

2) (This device must accept any interference received including

Caution: Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.

This device and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter except in accordance with FCC's multi-transmitter procedures.

IMPORTANT NOTE:

FCC Radiation Exposure Statement; Co-location of this module with other transmitter that operate simultaneously are required to be evaluated using the FCC multi-transmitter procedures.

The following text is placed in the host product, user guide:

"This module complies with the FCC portable exposure limits. This module has been tested in this specific host product and is installed with a separation distance of 0mm in this host product."

ISED Canada Compliance

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures.

Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

IMPORTANT NOTE:

IC Radiation Exposure Statement:

If the host manufacturer uses the module in a Mobile configuration then the following text is placed in the host product, user guide:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum separation distance of 20cm between the device and all persons.

Cet équipement est conforme aux limites d'exposition au rayonnement IC RSS-102 définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance de séparation minimale de 20 cm entre l'appareil et toutes les personnes.

The RF exposure (Nerve Stimulation) compliance distance is 10cm

La distance de conformité d'exposition à la RF (stimulation nerveuse) est de 10cm.

OR

If the host manufacturer uses the module in a Portable configuration then the following text is placed in the host product, user guide:

This device complies with the safety requirements for RF exposure in accordance with RSS-102 Issue 5 for portable use conditions.

Le présent appareil est conforme aux limites d'exposition aux RF conformément au norme CNR-102 émission 5 pour conditions d'utilisation portable.

The RF exposure (Nerve Stimulation) compliance distance is 10cm

La distance de conformité d'exposition à la RF (stimulation nerveuse) est de 10cm.

9. Host Product Label

The host product must be labelled with the following information:

"Contains FCC ID: 2AOR81909002"

"Contains IC: 23548-1909002 "

“This device complies with Part 15 of FCC Rules, Operation is Subject to following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received including interference that cause undesired operation.”

Important Notice to OEMs: The FCC Part 15 text must go on the Host product unless the product is too small to support a label with the text on it. It is not acceptable just to place the text in the user guide.

E-Labelling

It is possible for the Host product to use e-labelling providing the Host product supports the requirements of FCC KDB 784748 D02 e labelling and ISED Canada RSS-Gen, section 4.4.

E-labelling would be applicable for the FCC ID, ISED Canada certification number and the FCC Part 15 text.

Changes in Usage Conditions of the Module

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC and ISED Canada multi-transmitter product procedures.

If the device is co-located with multiple antennas, the module could be subject to FCC Class 2 Permissive Change and ISED Canada Class 4 Permissive Change policy in accordance with FCC KDB 996396 D01 and ISED Canada RSP-100.

In accordance with FCC KDB 996369 D03, section 2.9, test mode configuration information is available from the Module manufacturer for the Host (OEM) product manufacturer.